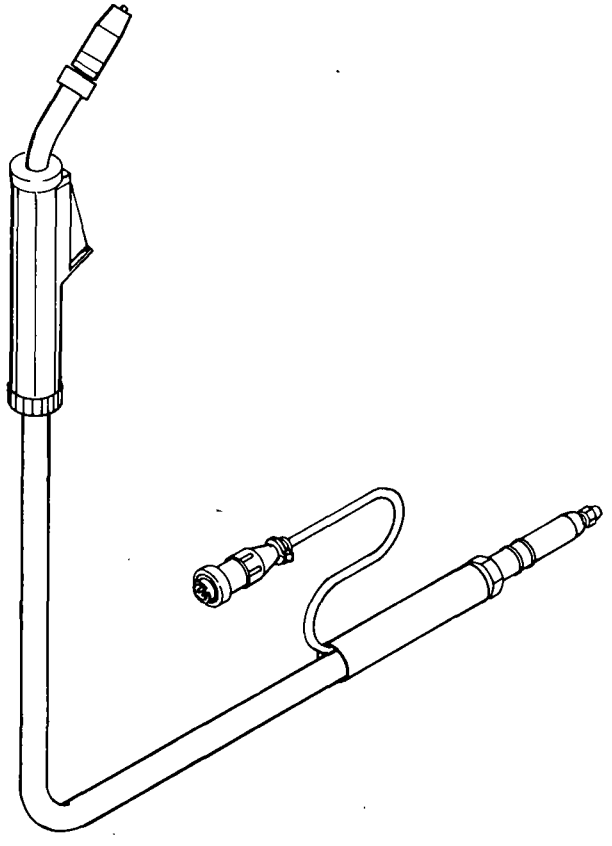
February 1989 FORM: 112 934

Effective With Style No. JG-20

IMPORTANT: Read and understand the entire contents of this manual, with special emphasis on the safety material throughout the manual, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.

MODEL
AUTO ARC
MWG 160
MWG 160B



OWNER'S MANUAL

AUTO ARC

MILLER ELECTRIC MFG. CO.
718 S. BOUNDS ST, P.O. Box 1079
APPLETON, WI 54912 USA

ADDITIONAL COPY PRICE 35 CENTS

NWSA CODE NO. 4579
PRINTED IN U.S.A.

ONE YEAR LIMITED WARRANTY

COVERAGE - Miller Electric Mfg. Co. warrants to the buyer who purchases this Auto Arc Welder ("Welder") for personal, family or household purposes ("Consumer") that this Welder will be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers only the original purchaser of this Welder. Miller Electric does not authorize any party, including its authorized distributors, to offer any other warranty on behalf of Miller Electric. Upon expiration of the warranty period, Miller Electric shall have no further liability related to the Welder, except on warranty claims made during the warranty period.

THIS WARRANTY IS OFFERED IN LIEU OF ANY OTHER EXPRESS WARRANTY; AND, EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, THE DURATION OF ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IS LIMITED TO THE DURATION OF THIS WARRANTY.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, and components ..... 1 year
2. Original main power rectifiers ..... 3 years (labor - 1 year only)
3. All welding guns, feeder/guns and plasma torches ... 90 days
4. Replacement or repair parts, exclusive of labor .. 60 days

WHAT IS NOT COVERED - This warranty does not extend to any Welder subjected to misuse, neglect, accident, or in-warranty repair by anyone except Miller Electric. Further, this warranty only extends to those purchasing the Welder for personal, family or household purposes. Commercial and industrial users are given a different warranty.

REMEDY FOR DEFECTIVE WELDER - Upon receipt of any defective Welder, Miller Electric will, at its option, repair or replace the defective Welder at its expense, refund or credit the purchase price (less reasonable depreciation based on actual use), or reimburse the Consumer for the cost of repair or replacement at an approved Miller Electric warranty station, provided that the purchaser of that Welder has followed the procedure for obtaining warranty performance set forth below. The Welder so repaired or used as a replacement will be shipped to the purchaser of the defective Welder, with transportation charges prepaid to any destination in the continental United States (transportation charges on shipments to Alaska or Hawaii will be paid only to the nearest port of export).

THE PURCHASER'S REMEDIES FOR A DEFECTIVE WELDER, TO THE EXTENT PERMITTED BY APPLICABLE LAW, ARE LIMITED TO THE REMEDY PROVIDED BY THIS WARRANTY: AND, TO THE EXTENT ENFORCEABLE UNDER APPLICABLE LAW, MILLER ELECTRIC SHALL IN NO EVENT BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES ARISING OUT OF THE USE OF, OR INABILITY TO USE, THE WELDER, WHETHER BASED ON BREACH OF THIS WARRANTY, MILLER ELECTRIC'S NEGLIGENCE OR OTHER TORT, OR ON ANY THEORY OF STRICT LIABILITY.

Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above limitations may not apply to you.

PROCEDURE FOR OBTAINING WARRANTY PERFORMANCE

As soon as any defect in a Welder becomes known, the purchaser of the Welder must, within thirty (30) days, notify an approved Warranty Station or Miller Electric in writing of the defect. The purchaser must then, within the one year warranty period, return the Welder to Miller Electric at the following address:

Miller Electric Mfg. Co.
718 South Bounds Street
P.O. Box 1079
Appleton, Wisconsin 54912

All transportation charges to Warranty Station or Miller Electric must be prepaid.

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SECTION 1 – INTRODUCTION

Ampere Rating 60% Duty Cycle	Wire Diameter	Cable Length	Cooling Method	Weight	
				Net	Ship
160 Amperes With CO_2	0.023 in. (.6 mm) 0.030 in. (.8 mm)	10 ft. (3.05 m)	Air	2.8 lbs. (1.3 kg)	5.4 lbs. (2.4 kg)

Figure 1-1. Specifications

1-1. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 - Safety Rules For Operation Of Arc Welding Power Source.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words **WARNING** and **CAUTION** which identify different levels of hazard.

WARNING statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, **IMPORTANT**, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

1-2. RECEIVING-HANDLING

Before installing this equipment, clean all packing material from around the unit and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading will be furnished by the manufacturer on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and Style Number of the equipment be supplied.

1-3. DESCRIPTION

This unit is an air-cooled semiautomatic Gas Metal Arc Welding (GMAW) or Flux Cored Arc Welding (FCAW) gun. The MWG 160 gun is shipped ready to feed 0.023 in. (0.6 mm) welding wire. The MWG 160B gun is shipped ready to feed 0.030 in (0.8 mm) welding wire. To change wire size, see Section 2-3.

1-4. DUTY CYCLE

The duty cycle of a welding gun is the percentage of a ten minute period that a gun can be operated at a given load. This gun is rated at 60% duty cycle using CO_2 shielding gas. This means that the gun can be operated six minutes out of every ten with the CO_2 gas shielding. The remaining four minutes the gun should be idle to permit proper cooling.

CAUTION: EXCEEDING THE RATED AMPERAGE WITH CO_2 OR FAILING TO REDUCE THE WELDING AMPERAGE OR DUTY CYCLE WHEN USING A MIXED SHIELDING GAS can result in damage to the gun.

- *Do not exceed rated amperage when using CO_2.*
- *Operate at 30% duty cycle when using mixed shielding gases.*

SECTION 2 – INSTALLATION

2-1. GUN/FEEDER CONNECTOR INSTALLATION (Figure 4-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing, inspecting, or servicing gun.*

  Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

1. Loosen gun/feeder connector securing knob on wire drive assembly.
2. Insert gun into wire drive assembly until gun/feeder connector hex stop is flush against wire drive assembly.

IMPORTANT: *The gun liner should be as close as possible to the drive rolls without touching them.*

3. Tighten gun/feeder connector securing knob.

2-2. GUN TRIGGER CONNECTIONS (Figure 4-1)

A. MWG 160 Gun

Align the keyway on the gun switch connector with the keyway on the Trigger Control receptacle. Insert the connector and rotate the threaded collar clockwise.

B. MWG 160B Gun

1. Locate the two leads hanging free from gun cable.
2. Route leads through small access hole on front panel.
3. Securely connect leads to matching leads behind panel.
4. Close and secure side access door.

2-3. CHANGING WIRE SIZE

The MWG 160 gun is shipped ready to feed 0.023 in. (0.6 mm) welding wire. The MWG 160B gun is shipped ready to feed 0.030 in. (0.8 mm) welding wire. The MWG 160 gun can be converted to feed 0.035 in. (0.9 mm) wire. Only the contact tube needs to be changed to permit either gun to feed the larger wire.

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down wire feeder and welding power source and disconnect input power employing "lockout/tagging procedures" before installing, inspecting, or servicing gun.*

  Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

1. Remove nozzle.
2. Cut off any portion of the electrode wire which extends beyond end of contact tube.

CAUTION: LOOSE WELDING WIRE can cause injury.

- *Keep a firm hold on the wire during installation, removal, and threading operations.*

  Spooled wire has tendency to unravel rapidly when loosened from the spool.

3. Retract wire onto wire spool.
4. Remove contact tube, and install new contact tube.
5. Reinstall nozzle.
6. Thread wire and resume operation.

SECTION 3 – SEQUENCE OF OPERATION

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Ventilate to keep from breathing fumes and gases.*
- *If ventilation is inadequate, use approved breathing device.*

WELDING WIRE can cause puncture wounds.

- *Do not point gun toward any part of the body or other personnel.*

HOT METAL, SPATTER, AND SLAG can cause fire and burns.

- *Watch for fie.*
- *Have a fire extinguisher nearby, and know how to use it.*
- *Allow work and equipment to cool before handling.*

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- *Wearers should consult with their doctor before going near arc welding, gouging, or spot welding operations.*

See Section 1 - Safety Rules For Operation Of Arc Welding Power Source for basic welding safety information.

CAUTION: EXCEEDING THE RATED AMPERAGE WITH CO_2 OR FAILING TO REDUCE THE WELDING AMPERAGE OR DUTY CYCLE WHEN USING A MIXED SHIELDING GAS can result in damage to the gun.

- *Do not exceed rated amperage when using CO_2.*
- *Operate at 30% duty cycle when using mixed shielding gases.*

IMPORTANT: *For welding wire threading, drive roll adjustment, welding power source, or wire feeder control information, see the appropriate Owner's Manual.*

3-1. GAS METAL ARC WELDING (GMAW)

IMPORTANT: *Read the warning information at the beginning of Section 3 - SEQUENCE OF OPERATION before operating.*

1. Ensure that proper electrical connections have been made to the welding power source and wire feeder.
2. Ensure that proper shielding gas is connected to shielding gas valve.
3. Ensure that welding wire has been properly threaded and that correct initial tensions have been set on drive rolls.
4. Turn on shielding gas supply.
5. Place controls on the welding power source and wire feeder in required position for the welding setup.
6. Energize welding power source and wire feeder.

IMPORTANT: *When installing new equipment, or after prolonged shutdown, allow shielding gas to flow continuously for at least one minute prior to welding to purge the shielding gas line. To avoid wasting wire while purging, loosen pressure adjustment knob on drive assembly, and pivot free from cover.*

7. Press Purge button on the wire feeder (if applicable) or open drive roll cover and press gun switch to purge gas line.
8. Close drive roll cover and adjust tension.
9. Actuate the gun trigger or Jog button on the wire feeder (if applicable) to run wire out beyond end of gas nozzle. Cut wire off so it sticks out approximately 1/4 to 3/8 in. (6.4 to 9.5 mm) from nozzle.
10. Hold end of gas nozzle approximately 1/2 in. (12.7 mm) from workpiece.
11. Press the gun trigger. Gas will start to flow, wire will start to feed, and the arc will be established. If wire slippage is noticed, tighten drive roll pressure adjustment 1/4 turn at a time until slippage stops. Do not overtighten.
12. After the controls on the welding power source and wire feeder have been adjusted for normal operation, welding power source and wire feeder will function automatically whenever the gun trigger is pressed. Releasing the trigger will extinguish the arc and cause wire feed and gas flow to stop.

3-2. FLUX CORED ARC WELDING (FCAW)

IMPORTANT: *Read the warning information at the beginning of Section 3 - SEQUENCE OF OPERATION before operating.*

1. Ensure that proper electrical connections have been made to the welding power source and wire feeder.
2. Ensure that welding wire has been properly threaded and that correct initial tensions have been set on drive rolls.

3. Place controls on the welding power source and wire feeder in required positions for the welding setup.

4. Actuate gun trigger or Jog button on the wire feeder to run wire out beyond the nozzle. Cut wire off so it sticks out approximately 0.25 in. (6.4 mm).

5. Hold the gun approximately 0.50 in. (12.8 mm) from the workpiece.

6. Press the gun trigger. Wire will start to feed and the arc will be established. If wire slippage is noticed, tighten drive roll pressure adjustment 1/4 turn at a time until slippage stops. Do not overtighten.

7. After the controls on the welding power source and wire feeder have been adjusted for normal operation, welding power source and wire feeder will function automatically whenever the gun trigger is pressed. Releasing the trigger will extinguish the arc and stop the wire from feeding.

3-3. SHUTTING DOWN

1. Stop welding.
2. Turn off welding power source and wire feeder.
3. If used, turn off the shielding gas at the source.

WARNING: HIGH CONCENTRATION OF SHIELDING GAS can harm health or kill.

- *Shut off gas supply when not in use.*

SECTION 4 – MAINTENANCE

4-1. INSPECTION AND UPKEEP

Usage and shop conditions will determine frequency and type of maintenance required.

ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing, inspecting, or servicing gun.*

  Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

1. Inspect gun for broken areas, cracks, and loose parts; tighten, repair, and replace as required.
2. Carefully remove any weld spatter or foreign matter which may accumulate around the nozzle opening.
3. Remove any accumulation around the switch.
4. Repair or replace as required all hose and cabling; give particular attention to frayed and cracking insulation and areas where hose and cabling enter equipment.
5. Remove grease and grime from components; moisture from electrical parts and cables.

CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- *Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.*

6. Blow out gun casing or liner with compressed air whenever the wire or liner is removed.

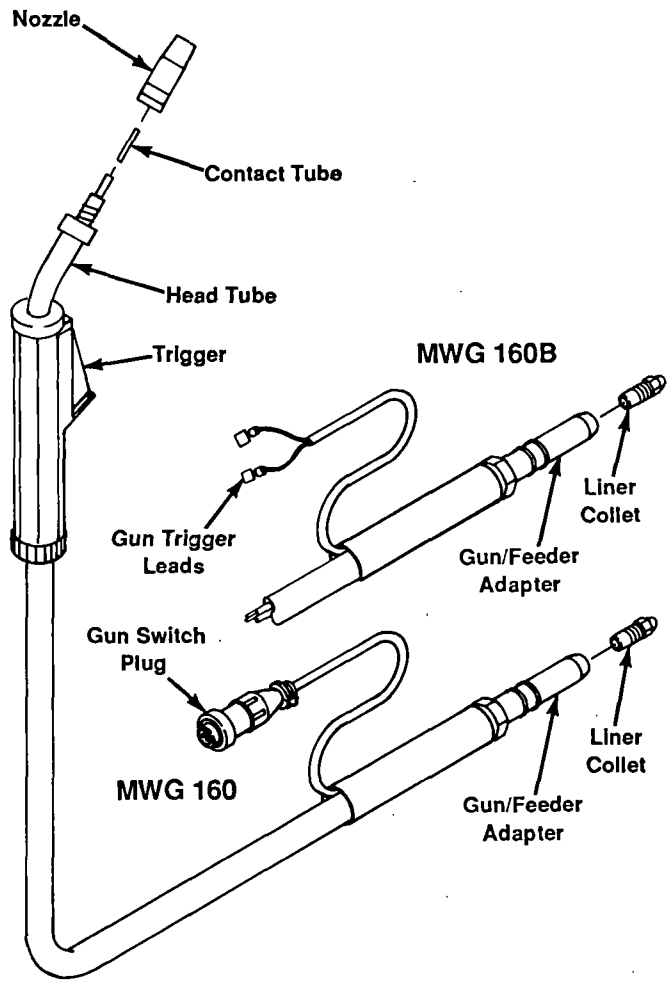

Figure 4-1. Gun Parts Replacement

4-2. CONTACT TUBE REPLACEMENT (Figure 4-1)

ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing, inspecting, or servicing gun.*

Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging a circuit breaker or other disconnecting device.

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

1. Remove nozzle.
2. Cut off any portion of the electrode wire which extends beyond end of contact tube.
3. Remove contact tube, and install new contact tube.
4. Reinstall nozzle, and resume operation.

4-3. LINER REPLACEMENT (Figure 4-1)

ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing, inspecting, or servicing gun.*

Lockout/tagging procedures consist of removing input power plug from receptacle, padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

1. Remove nozzle.
2. Cut off any portion of the electrode wire which extends beyond end of contact tube.
3. Remove contact tube.

CAUTION: LOOSE WELDING WIRE can cause injury.

- *Keep a firm hold on the wire during installation, removal, and threading operations.*

Spooled wire has tendency to unravel rapidly when loosened from the spool.

4. Retract wire onto wire spool.
5. Disconnect gun assembly from wire drive assembly.
6. Remove liner collet.
7. Lay cable assembly out flat and straight (no coils in the cable/conduit).
8. Pull out the liner from gun/feeder connector end of gun assembly.

CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- *Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.*

9. Blow out gun casing or liner with compressed air whenever the wire or liner is removed.
10. Insert new liner into gun/feeder adapter end of gun assembly. Liner should be flush with end of head tube.
11. Install collet onto liner and into gun/feeder adapter. Be sure liner is still flush with end of head tube.
12. Reinstall appropriate contact tube and nozzle.
13. Cut liner off at gun/feeder adapter end so that when installed in wire drive assembly liner is as close as possible to the drive rolls without touching.
14. Reinstall gun to wire drive assembly.
15. Thread welding wire and resume operation.

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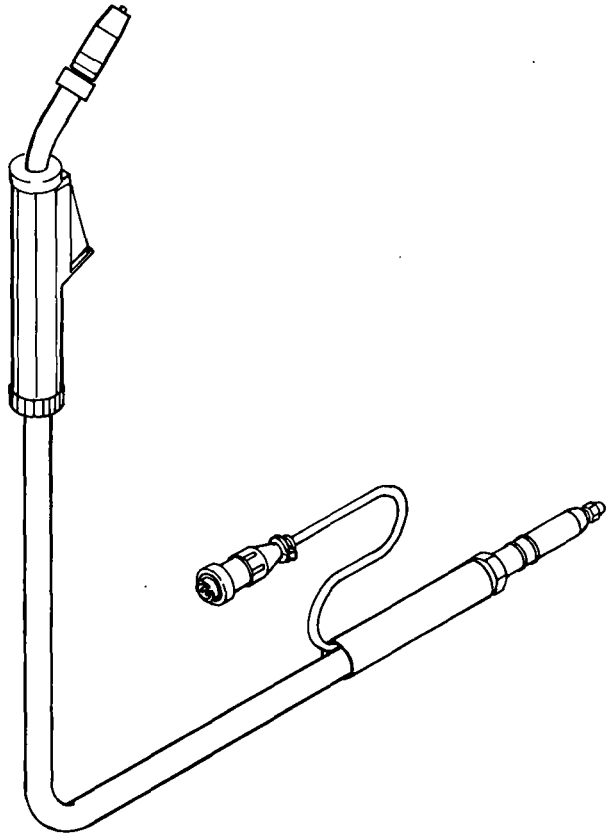
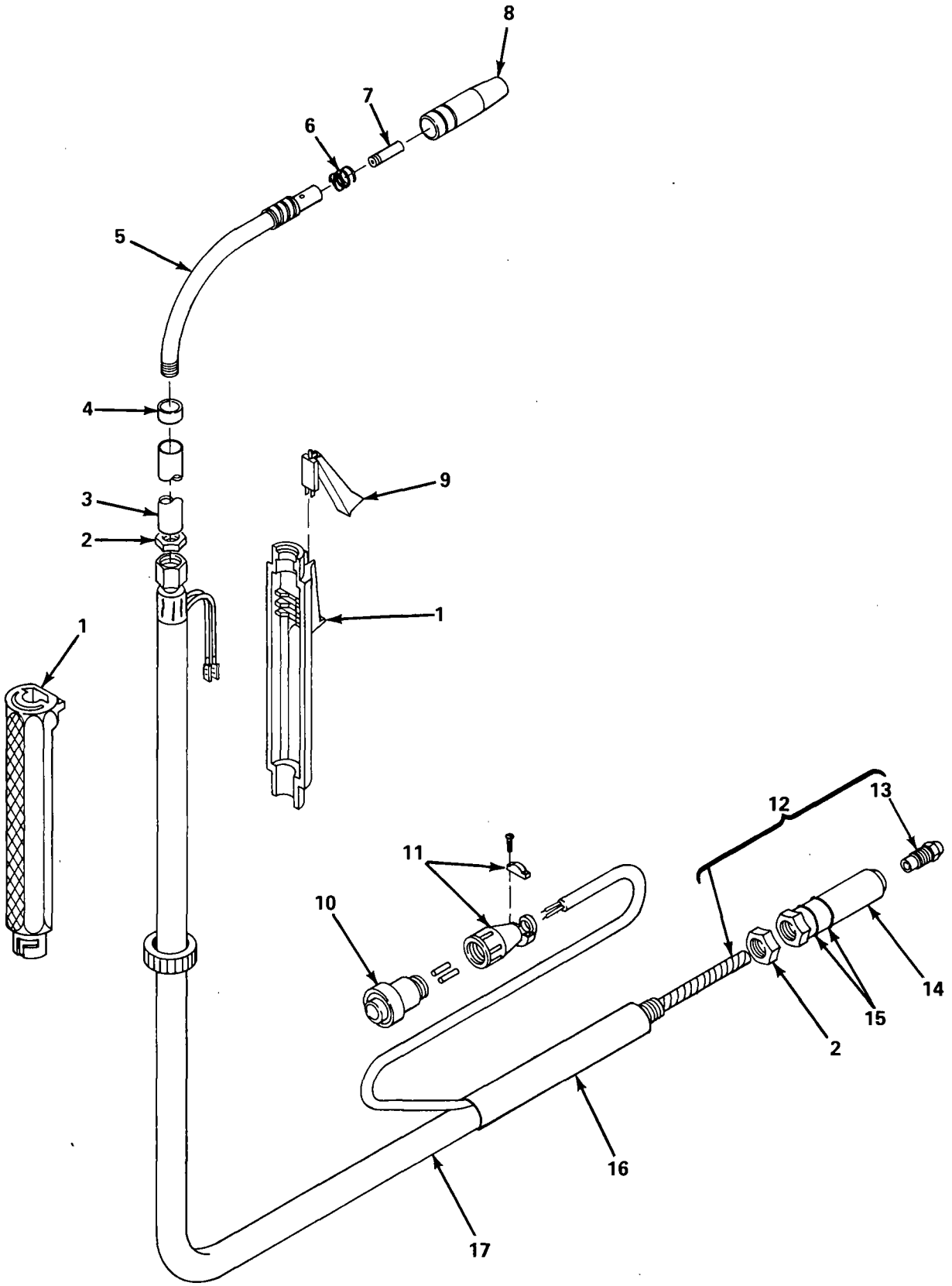


PARTS LIST



TC-110 832

Figure A - Exploded View Of MWG 160 Gun

Item No.	Part No.	Description	Quantity
Figure A		**Exploded View Of Gun**	
1	110 793	HANDLE ASSEMBLY	1
2	110 780	NUT, M 10 x 1	2
3	110 779	JACKET, head tube	1
4	110 781	STOP, nozzle	1
5	110 795	TUBE, head	1
6	110 782	SPRING ,nozzle	1
7	112 743	TUBE, contact .024 wire (MWG 160)	1
7	112 751	TUBE, contact .030 wire (MWG 160B)	1
8	112 747	NOZZLE, slip type 1/2 orifice	1
8	♦113 018	NOZZLE, slip type 3/8 orifice	1
8	♦113 022	NOZZLE, spot-flat	1
8	♦113 020	NOZZLE, spot	1
9	110 794	TRIGGER SWITCH ASSEMBLY	1
10	079 878	HOUSING PLUG & PINS (MWG 160) (consisting of)	1
	079 535	· TERMINAL, male	4
10	047 994	TERMINAL, friction-female (MWG 160B)	2
11	048 834	CLAMP, cable (MWG 160)	1
12	112 745	LINER, .024 wire 10 ft. (MWG 160) (consisting of)	1
12	121 905	LINER, .030 wire 10 ft. (MWG 160B) (consisting of)	1
13	110 784	· COLLET, liner .024 wire (MWG 160)	1
13	120 715	· COLLET, liner .030 wire (MWG 160B)	1
14	110 796	ADAPTER, gun/feeder	1
15	079 974	O-RING, 1/2 ID x .103	2
16	110 797	SLEEVE, rubber	1
17	110 792	CABLE, 10 ft.	1

♦Optional Equipment

BE SURE TO PROVIDE MODEL AND STYLE NUMBER WHEN ORDERING REPLACEMENT PARTS.